CLAIMS

1. An adaptive directional sound processing system, comprising:

at least first and second microphones spaced apart by a distance, said first microphones producing a first electronic sound signal and said second microphone producing a second electronic sound signal;

means for processing the second electronic sound signal to adaptively produce a compensation scaling amount that compensates for sensitivity differences between said first and second microphones;

a scaling circuit operatively connected to said means for scaling and said second microphone, said scaling circuit operates to scale the second electronic sound signal in accordance with the compensation scaling amount; and

a subtraction circuit operatively connected to said scaling circuit and said first microphone, said subtraction circuit producing an output difference signal by subtracting the scaled second electronic sound signal from the first electronic sound signal.

2. An adaptive directional sound processing system as recited in claim 1, wherein said adaptive directional sound processing system further comprises:

a delay circuit that delays the second electronic sound signal or the scaled second electronic sound signal by a delay amount.

3. An adaptive directional sound processing system, comprising:

at least first and second microphones spaced apart by a predetermined distance, said first microphone producing a first electronic sound signal and said second microphone producing a second electronic sound signal;

a first minimum estimate circuit operatively coupled to said first microphone, said first minimum estimate circuit produces a first minimum estimate for the first electronic sound signal from said first microphone;

a second minimum estimate circuit operatively coupled to said second microphone, said second minimum estimate circuit produces a second minimum estimate for the second electronic sound signal from said second microphone;

a divide circuit operatively connected to said first and second minimum estimate circuits, said divide circuit operates to produce a scaling signal from the first and second minimum estimates;

a multiply circuit operatively connected to said divide circuit and said second microphone, said multiply circuit operates to multiply the second electronic sound signal by the scaling signal to produce a scaled second electronic sound signal; and

a subtraction circuit operatively connected to said multiply circuit and said first microphone, said subtraction circuit producing an output difference signal by subtracting the scaled second electronic sound signal from the first electronic sound signal.

4. An adaptive directional sound processing system as recited in claim 3, wherein said adaptive directional sound processing system further comprises:

a delay circuit that delays the second electronic sound signal or the scaled second electronic sound signal by a delay amount.

5. An adaptive directional sound processing system as recited in claim 3, wherein said divide circuit operates in a linear domain.

6. An adaptive directional sound processing system as recited in claim 3, wherein said divide circuit operates in a logarithm domain.

7. An adaptive directional sound processing system as recited in claim 3, wherein said divide circuit comprises:

a first linear-to-logarithm conversion circuit operatively coupled to said first minimum estimate circuit to produce a converted first minimum estimate circuit;

a second linear-to-logarithm conversion circuit operatively coupled to said second minimum estimate circuit to produce a converted second minimum estimate circuit;

a subtraction circuit operatively connected to said a first linear-to-logarithm conversion circuit and said second linear-to-logarithm conversion circuit to produce a difference signal; and

a logarithm-to-linear conversion circuit operatively connected to said subtraction circuit to converted the difference signal to the scaling signal.

8. An adaptive directional sound processing system as recited in claim 3, wherein at least one of said first minimum estimate circuit and said second minimum estimate circuit comprises:

a subtraction circuit that subtracts the first electronic sound signal from a previous minimum estimate in producing a difference signal;

a multiply circuit that multiplies the difference signal by a scale amount to produce an adjustment amount; and

an addition circuit that adds the adjustment amount to the previous minimum estimate in producing a current minimum estimate.

9. An adaptive directional sound processing system as recited in claim 3, wherein, wherein said adaptive directional sound processing system resides within a hearing aid device.

10. A hearing aid device having an adaptive directional sound processing, said hearing aid device comprising:

at least first and second microphones spaced apart by a distance, said first microphone producing a first electronic sound signal and said second microphone producing a second electronic sound signal;

sensitivity difference detection circuitry operatively connected to said first and second microphones, said sensitivity difference detection circuitry adaptively produces a compensation scaling amount corresponding to sensitivity differences between said first and second microphones;

a scaling circuit operatively connected to said sensitivity difference detection circuitry and said second microphone, said scaling circuit operates to scale the second electronic sound signal in accordance with the compensation scaling amount; and

a subtraction circuit operatively connected to said scaling circuit and said first microphone, said subtraction circuit producing an output difference signal by subtracting the scaled second electronic sound signal from the first electronic sound signal.

11. A hearing aid device as recited in claim 10, wherein said hearing aid device further comprises:

a delay circuit that delays the second electronic sound signal or the scaled second electronic sound signal by a delay amount.

12. A method for adaptively measuring and compensating for acoustical differences between sound signals picked up by microphones, said method comprising:

(a) receiving first and second electronic sound signals from first and second microphones, respectively;

(b) determining a compensation scaling amount that compensates for acoustic differences with respect to the first and second microphones;

(c) scaling the second electronic sound signal in accordance with the compensation scaling amount; and

(d) producing a differential electronic sound signal by subtracting the scaled second electronic sound signal from the first electronic sound signal.

13. A method as recited in claim 12, wherein the acoustic differences pertain to at least differences in microphone sensitivity.

14. A method as recited in claim 13, wherein said determining (b) comprises:

(b1) measuring a sensitivity difference between the first and second microphones while in use; and

(b2) producing the compensation scaling amount based on the sensitivity difference.

15. A method as recited in claim 14, wherein said measuring (b1) of the sensitivity difference is performed using minimum estimates of the first and second sound signals.

16. A method as recited in claim 14, wherein said measuring (b1) of the sensitivity difference is performed using maximum estimates of the first and second sound signals.

17. A method as recited in claim 14, wherein said measuring (b1) of the sensitivity difference is performed using Root-Mean-Square (RMS) averages of the first and second sound signals.

18. A method as recited in claim 13, wherein said determining (b) comprises:

(b1) determining a first minimum estimate of the first electronic sound signal;

(b2) determining a second minimum estimate of the second electronic sound signal;

(b3) dividing the first minimum estimate by the second minimum estimate to produce the compensation scaling amount.

19. A method as recited in claim 13, wherein said determining (b) comprises:

(b1) determining a first minimum estimate of the first electronic sound signal;

(b2) determining a second minimum estimate of the second electronic sound signal;

(b3) converting the first minimum estimate to a logarithm scale first minimum estimate;

(b4) converting the second minimum estimate to a logarithm scale second minimum estimate;

(b5) subtracting the logarithm scale second minimum estimate from the logarithm scale first minimum estimate to produce a difference signal; and

(b6) converting the difference signal from the logarithm scale to a linear scale, the converted difference signal being the compensation scaling amount.

20. A method as recited in claim 12, wherein the microphones are provided within a hearing aid device, and wherein said method is performed by the hearing aid device.